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Ability to "See" Through Rock Helps Find Oil Reserves

Electromagnetic Imaging Holds Promise for Untapped Resources

Washington, DC - Successful tests with a new technology funded by the Department of Energy (DOE) have allowed geologists to "see" through thousands of feet of rock to find and tap pockets of oil. Known as "cross-well electromagnetic imaging," the technology penetrates the rocks between oil wells with very long and slow electromagnetic waves.

"This technology will increase oil production from existing reservoirs and could be a valuable tool in locating new reservoirs," Secretary of Energy Spencer Abraham said. "If the technology proves successful, this could help reduce our dependence on foreign oil imports and improve our nation's energy security."

In the process, a transmitter is lowered into one well and a string of receivers is lowered into a neighboring well. As the transmitter is moved vertically, it sends an electrical current through the rock to measure changes in the fluids (oil, water) and gases in the rock.

The significance of the new well-logging tool is that it can "see" through the rocks between wells that are up to 2,000 feet to 3,000 feet apart. This means that fewer wells are needed to produce a three-dimensional view of a reservoir— saving time, improving environmental performance, and reducing costs. Plus, the latest versions of the tool can "see" through the steel casings that are used to complete wells and prepare them for producing.

Cross-well electromagnetic imaging is particularly useful in finding residual oil in low-producing oilfields like those in central California. It allows oilfield operators to see where the residual oil is located and how the injected fluids (like steam) are working to force the oil out of the rock formations. Successful tests using the imaging occurred in 1998 at the Kern River Field and in 1999-2000 at the Lost Hills Field.

Most recently, the tool enabled Chevron-Texaco, to see through the steel casing of the transmission and receiving wells at the Vacuum field in New Mexico. This was part of a three-year project funded by DOE to monitor carbon dioxide injection at the wells. Chevron-Texaco saw results 10 times greater than previous data collection techniques used at the field.

- End of Techline -

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